

In the Claims:

Claims 1 to 51 (Canceled).

1 **52.** (new) A gas sensor for sensing a gas or gas composition at
2 high temperatures, said gas sensor comprising a substrate
3 (1) having a sensor carrier section with a tip (10) and a
4 conductor carrier section (9) connected to said sensor
5 carrier section opposite said tip (10), said sensor carrier
6 section having zones with varying heat dissipations, a gas
7 sensor function layer (4) supported by said sensor carrier
8 section of said substrate (1) next to said tip (10), an
9 electrical heater (6) supported by said sensor carrier
10 section in a position for heating said gas sensor function
11 layer (4), electric power supply conductors (2) supported
12 on said conductor carrier section (9) of said substrate (1)
13 and electrically connected to said electrical heater (6),
14 said electrical heater (6) comprising heater sections
15 having different heating resistance values which depend on
16 a spacing between any particular heater section and said
17 tip (10) of said sensor carrier section, said different
18 heating resistance values generating varying amounts of
19 heat for compensating said varying heat dissipations, said
20 gas sensor further comprising at least one temperature
21 sensing conductor path (12) electrically connected to said
22 electrical heater (6) at least at one contact point,
23 wherein said at least one contact point between said
24 electrical heater (6) and said at least one temperature

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25 sensing conductor path (12) is positioned on said sensor
26 carrier section for measuring an operating temperature of
27 said sensor carrier section to provide a closed loop
28 control signal for said electrical heater to maintain said
29 operating temperature at a minimal temperature gradient
30 throughout said gas sensor function layer, wherein said
31 electrical heater (6) comprises two meandering heater paths
32 (6A, 6B) and an intermediate heater portion (6C) positioned
33 next to said tip (10), said intermediate heater portion
34 electrically connecting said two meandering heater paths
35 (6A, 6B) in series with each other, said meandering heater
36 paths (6A, 6B) having amplitudes forming said heater
37 sections, and wherein said amplitudes are diminishing in
38 their size from said conductor carrier section (9) toward
39 said tip (10) depending on said spacing between any
40 particular heater section formed by a respective amplitude
41 and said tip (10).

1 53. (new) The gas sensor of claim 52, wherein said electrical
2 heater (6) comprises a heater path having a path width (b)
3 along said heater sections, said path width (b) varying
4 depending on said spacing between any particular heater
5 section and said tip (10).

1 54. (new) The gas sensor of claim 52, wherein said gas sensor
2 function layer (4) has a length (L) toward said tip (10)
3 and wherein said at least one contact point is located

4 along said length (L) of said gas sensor function layer (4)
5 and below said gas sensor function layer (4).

1 55. (new) The gas sensor of claim 52, comprising at least two
2 contact points (12A' and 12B') between said temperature
3 sensing conductor path (12) and said electrical heater (6)
4 for selecting a different resistance value from at least
5 two different resistance values of said electrical heater
6 (6).

1 56. (new) The gas sensor of claim 52, wherein said gas sensor
2 function layer (4) is secured to one side or surface of
3 said sensor carrier section of said substrate (1), and
4 wherein said electrical heater (6) is attached to an
5 opposite side or surface of said sensor carrier section of
6 said substrate (1) in said position for heating said gas
7 sensor function layer (4).

1 57. (new) A gas sensor for sensing a gas or gas composition at
2 high temperatures, said gas sensor comprising a substrate
3 (1) having a sensor carrier section with a tip (10) and a
4 conductor carrier section (9) connected to said sensor
5 carrier section opposite said tip (10), said sensor carrier
6 section having zones with varying heat dissipations, a gas
7 sensor function layer (4) supported by said sensor carrier
8 section of said substrate (1) next to said tip (10), an
9 electrical heater (6) supported by said sensor carrier
10 section in a position for heating said gas sensor function

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11 layer (4), electric power supply conductors (2) supported
12 on said conductor carrier section (9) of said substrate (1)
13 and electrically connected to said electrical heater (6),
14 said electrical heater (6) comprising heater sections
15 having different heating resistance values which depend on
16 a spacing between any particular heater section and said
17 tip (10) of said sensor carrier section, said different
18 heating resistance values generating varying amounts of
19 heat for compensating said varying heat dissipations, said
20 gas sensor further comprising at least one temperature
21 sensing conductor path (12) electrically connected to said
22 electrical heater (6) at least at one contact point,
23 wherein said at least one contact point between said
24 electrical heater (6) and said at least one temperature
25 sensing conductor path (12) is positioned on said sensor
26 carrier section for measuring an operating temperature of
27 said sensor carrier section to provide a closed loop
28 control signal for said electrical heater to maintain said
29 operating temperature at a minimal temperature gradient
30 throughout said gas sensor function layer, wherein said
31 electrical heater (6) comprises a heater path having a path
32 length along said heater sections and a path width (b),
33 wherein said path length and said path width (b) both vary
34 depending on said spacing between any particular heater
35 section and said tip (10), wherein said heater path length
36 diminishes from heater section to heater section toward

37 said tip (10), and wherein said path width (b) increases
38 from heater section to heater section toward said tip (10).

1 58. (new) The gas sensor of claim 57, wherein said gas sensor
2 function layer (4) is secured to one side or surface of
3 said sensor carrier section of said substrate (1), and
4 wherein said electrical heater (6) is attached to an
5 opposite side or surface of said sensor carrier section of
6 said substrate (1) in said position for heating said gas
7 sensor function layer (4).

1 59. (new) The gas sensor of claim 57, wherein said gas sensor
2 function layer (4) has a length (L) toward said tip (10)
3 and wherein said at least one contact point is located
4 along said length (L) of said gas sensor function layer (4)
5 and below said gas sensor function layer (4).

1 60. (new) The gas sensor of claim 57, comprising at least two
2 contact points (12A' and 12B') between said temperature
3 sensing conductor path (12) and said electrical heater (6)
4 for selecting a different resistance value from at least
5 two such different resistance values of said electrical
6 heater (6).

1 61. (new) A gas sensor for sensing a gas or gas composition at
2 high temperatures, said gas sensor comprising a substrate
3 (1) having a sensor carrier section with a tip (10) and a
4 conductor carrier section (9) connected to said sensor

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5 carrier section opposite said tip (10), said sensor carrier
6 section having zones with varying heat dissipations, a gas
7 sensor function layer (4) supported by said sensor carrier
8 section of said substrate (1) next to said tip (10), an
9 electrical heater (6) supported by said sensor carrier
10 section in a position for heating said gas sensor function
11 layer (4), electric power supply conductors (2) supported
12 on said conductor carrier section (9) of said substrate (1)
13 and electrically connected to said electrical heater (6),
14 said electrical heater (6) comprising heater sections
15 having different heating resistance values which depend on
16 a spacing between any particular heater section and said
17 tip (10) of said sensor carrier section, said different
18 heating resistance values generating varying amounts of
19 heat for compensating said varying heat dissipations, said
20 gas sensor further comprising two temperature sensing
21 conductor paths (12A, 12B) electrically connected to said
22 electrical heater (6) at two respective contact points,
23 positioned on said sensor carrier section for measuring an
24 operating temperature of said sensor carrier section to
25 provide a closed loop control signal for said electrical
26 heater to maintain said operating temperature at a minimal
27 temperature gradient throughout said gas sensor function
28 layer, and wherein said electrical heater (6) comprises an
29 intermediate heater portion (6C) and at least two
30 meandering heater paths (6A, 6B) electrically connected in
31 series with each other by said intermediate heater portion
32 (6C) to form an electrical heater series connection,
33 wherein said two respective temperature sensing conductor

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34 paths (12A, 12B) are connected to said electrical heater
35 series connection by said two respective contact points,
36 (12A', 12B'), and wherein said two contact points (12A',
37 12B') are spaced from each other along said electrical
38 heater series connection at a predetermined spacing between
39 said two contact points.

1 62. (new) The gas sensor of claim 61, wherein said gas sensor
2 function layer (4) is secured to one side or surface of
3 said sensor carrier section of said substrate (1), and
4 wherein said electrical heater (6) is attached to an
5 opposite side or surface of said sensor carrier section of
6 said substrate (1) in said position for heating said gas
7 sensor function layer (4).

1 63. (new) The gas sensor of claim 60, wherein said electrical
2 heater (6) comprises a heater path having a path width (b)
3 along said heater sections, said path width (b) varying
4 depending on said spacing between any particular heater
5 section and said tip (10).

1 64. (new) The gas sensor of claim 60, wherein said gas sensor
2 function layer (4) has a length (L) toward said tip (10)
3 and wherein at least one contact point of said two contact
4 points is located along said length (L) of said gas sensor
5 function layer (4) and below said gas sensor function layer
6 (4).

1 **65.** (new) A gas sensor for sensing a gas or a gas composition
2 at high temperatures, said gas sensor comprising a
3 substrate (1) including a sensor carrier section with a tip
4 (10) and a gas sensor function layer (4) supported by said
5 sensor carrier section, an electrical heater (6) supported
6 by said sensor carrier section, said electrical heater
7 comprising at least one meandering heater path including
8 amplitudes forming heater sections, each heater section
9 having a different heating resistance value which depends
10 on a spacing between said tip and a respective heater
11 section of said heater sections, and wherein said
12 amplitudes forming said heater sections diminish toward
13 said tip for maintaining an operating temperature of said
14 sensor carrier section at a minimal temperature gradient
15 throughout said gas sensor function layer (4).

1 **66.** (new) The gas sensor of claim 65, further comprising at
2 least one temperature sensing conductor path (12)
3 electrically connected to said electrical heater (6) for
4 measuring said operating temperature to provide a control
5 signal for controlling said operating temperature.

1 **67.** (new) The gas sensor of claim 65, wherein said gas sensor
2 function layer (4) is secured to one side or surface of
3 said sensor carrier section of said substrate (1), and
4 wherein said electrical heater (6) is attached to an
5 opposite side or surface of said sensor carrier section of

6 said substrate (1) in said position for heating said gas
7 sensor function layer (4).

1 68. (new) A gas sensor for sensing a gas or a gas composition
2 at high temperatures, said gas sensor comprising a
3 substrate (1) including a sensor carrier section with a tip
4 (10) and a gas sensor function layer (4) supported by said
5 sensor carrier section, an electrical heater (6) supported
6 by said sensor carrier section, said electrical heater
7 comprising at least one meandering heater path including
8 amplitudes forming heater sections, each heater section
9 having a different heating resistance value which depends
10 on a spacing between said tip and a respective heater
11 section of said heater sections, wherein said heater
12 sections form at least two groups of heater sections, and
13 wherein said amplitudes forming each group of said heater
14 sections diminish toward said tip for maintaining an
15 operating temperature of said sensor carrier section at a
16 minimal temperature gradient throughout said gas sensor
17 function layer (4).

[RESPONSE CONTINUES ON NEXT PAGE]